The influence of human behaviour on house loss

Raphaele Blanchi, Justin Leonard
Sustainable Ecosystems, CSIRO, VIC

Introduction

Bushfires present specific risks to life and property when they reach the interface between wildland area and urban area. Effective assessment of bush fire risk and house loss risk should address a range of factors such as fire weather, fuel load, topography, building design and building location, and occupant knowledge and behaviour.
-Out of this parameters we focus on the study of human behaviour in the last 30 years.

Methodology

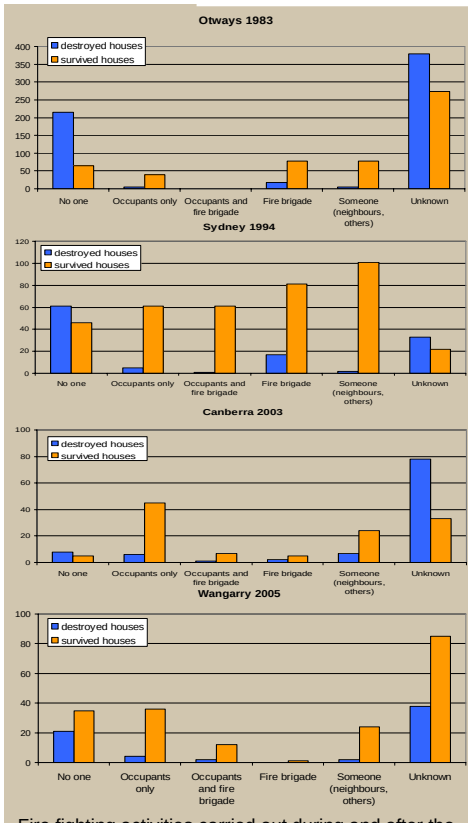
The analysis is based on data collected in different surveys conducted after large bushfire events resulting in significant house loss (from Ash Wednesday 1983 to the Eyre Peninsula 2005). Data was collected from on-site inspection, owners/occupants interviews, and from shire councils and various organisations records. The data collected include details of the extent of damage in the fire, extensive information on the structure of house, site details, description of surroundings, and details of the action of residents and fire fighters during the event. A total of 2125 houses as been considered

Eyre Peninsula, 2005

Canberra, 2003

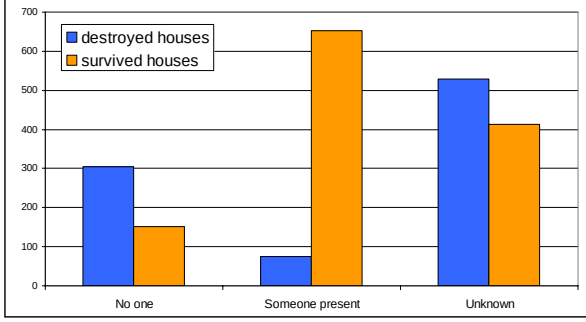
Bushfire	People presence	Relative risk of house being destroyed if no one is present	Weather	Impact	Source
Ash Wednesday (VIC and SA) 1983	**19%**	**6.5** greater chance	FFDI*: 102	75 deaths 2000 houses destroyed 290,000 ha burnt	Ramsay et alt 1985, 1987 CFA, 1983
Sydney 1994	**67%**	**7.5** greater chance	FFDI: 88	202 houses destroyed 600,000 ha burnt,	Speer et alt, 1996 Leonard, 1999
Canberra 2003	**44%**	**3.7** greater chance	FFDI: 103	4 deaths 519 houses destroyed 160,000 ha	Leonard, 2005 McLeod, 2003
Wangarry 2005	**37%**	**3.8** greater chance	FFDI: 120	9 deaths 90 houses destroyed 77,000 burnt	Blanchi, 2005 Rhodes, 2005 BOM

* Forest fire danger index varies below 5 (low) to 50 and more (extreme)



Fire fighting activities carried out during and after the bushfire event/number of house loss

Influence of human activity during and after the bushfire event (summary of the Otways 1983, Sydney 2001, Canberra 2003, Wangary 2005 data)



Otways, 1983

Importance of human behaviour

Human activity is the single biggest factor in influence house loss risk for Australian Bushfires due to their capacity to extinguish small ignitions outside and within surrounding structures once the fire front has passed The role of occupant and brigade interaction was identified as being significant in reducing house losses in the four surveys data sets. In addition to the occupant action the fire service intervention (if they are present) significantly improves house survival, as they are better equipped and have the ability to actively defend against more aggressive attack including more heavily involved house fires.
However the information should be used with caution as there is a bias introduced by the lower number of known occupant behaviour for destroyed houses, and a bias introduce by the sample of house surveys, which is not completely random for each fire.

Contact:

Raphaele.blanchi@csiro.au, Justin.leonard@csiro.au